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ABSTRACT

This study attempted to: (1) identify differences, among full-time academic faculty in eight disciplines and five major institutional types, regarding their goals for classroom instruction, their assumptions about undergraduate students and the conditions under which students learn best, and their teaching practices; and (2) determine which of the two organizational dimensions, institutional type or academic discipline, is the stronger predictor of faculty members' goals, assumptions, and practices. A survey of 8,130 faculty members teaching in 5 major institutional categories was conducted between November 1987, and January 1988; of this total 3,972 replied, for a response rate of 48.9 percent. Analysis of results indicated that the transmission of facts, principles, and theories were the major instructional goals. Slightly less important was the demonstration of intellectual, artistic, or scientific process. The faculty also agreed that they alone should determine course content and pace. The assumptions about undergraduate students were positive: the students were seen as being able to think on their own, hardworking, and well-motivated. Differences of opinion usually split across institutional lines, with faculty at research and doctoral institutions less interested than faculty in comprehensive and community colleges in emphasizing non-intellectual instructional goals such as developing or improving the students' social and economic conditions, or engaging in formal modes of individualized instruction. Tables are included. Contains 26 references. (GLR)

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A Comparison of the Teaching Goals, Assumptions, and Practices
of Faculty in Eight Liberal Arts Disciplines

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This paper was presented at the annual meeting of the Association for the Study of Higher Education held at the Red Lion-Jantzen Beach in Portland, Oregon, November 1-4, 1990. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

Introduction and Objectives

Critics of American higher education frequently cite a lack of faculty teaching effectiveness as one of the many persistent problems facing our colleges and universities. Parents, students, and the news media have joined more formal entities like the National Institute for Education in charging that college and university faculty and administrators neglect one of their primary responsibilities, the teaching function. These individuals and groups focus particularly on examples of poor teaching because they believe that ineffective teaching results in a decrease in student learning.

During the 1970s the Federal government and private foundations funded a variety of faculty development programs in response to these concerns. Aimed at developing college teaching expertise, many faculty development programs explicitly phrased their missions to include improving student learning through increasing faculty teaching effectiveness (Centra, 1975). Most programs, sometimes staffed by faculty and sometimes by teaching "experts," were centralized as offices serving an entire institution. While results from some were impressive, most lasted only as long as did their outside funding. Some authors (e.g., Stark, et al., 1990) have suggested that one of the reasons for the apparent failure of faculty development programs in improving teaching on a broad scale has been their lack of sensitivity to differences in disciplinary teaching behavior and perspectives. These commentators indicate that disciplinary differences, including differences in goals for instruction and beliefs about teaching and learning, cannot be overlooked in the search for ways to assist faculty with evaluating and improving their teaching.

The purposes of this study are two fold. First, we identify differences among full-time academic faculty in eight disciplines and in five major institutional types regarding (a) their goals for classroom instruction, (b) their assumptions about undergraduate students and the conditions under which the students learn best, and (c) their teaching practices. Second, we determine which of the two organizational dimensions, institutional type or academic discipline, is the stronger predictor of faculty members' teaching goals, assumptions, and practices.

Theoretical Perspective

Although the teaching and learning environment can be conceptualized in a variety of ways (McKeachie, Pintrich, Lin, & Smith, 1986), we focus on three aspects: (1) faculty goals for learning, (2) assumptions about students and optimal learning conditions, and (3) classroom teaching practices. Faculty members' instructional goals and their assumptions about students and the ways in which students learn best are likely to underlie their decision processes when they are designing and implementing courses. One rationale for our focus stems from the research on college faculty. This literature suggests that faculty teaching practices are influenced by (a) institutional context (Peterson, Cameron, Mets, Jones, & Ettington, 1986); (b) the structure of the disciplines (Gaff & Wilson, 1975; Morstain & Smart, 1976; Stark and Morstain, 1978; Gamson, 1966; Dressel & Marcus, 1982); and (c) their individual values and beliefs (Finkelstein, 1984; Blackburn, Lawrence, Ross, Okoloko, Bieber, Meiland, & Street, 1986). Differences in the priorities and beliefs of faculty in different disciplines that result in different instructional activities could have an impact on student learning.

Faculty perform their teaching, scholarship, research, and service roles differently depending, at least in part, upon their academic discipline (Finkelstein, 1984). Biglan (1971, 1973) analyzed disciplinary differences in faculty members' research orientation. He found that the structural characteristics of academic tasks were responsible for variations. Others have demonstrated and discussed differences in educational goals and practices for students among faculty discipline groups (Gaff & Wilson, 1975; Morstain & Smart, 1976; Stark and Morstain, 1978; Gamson, 1966; Dressel & Marcus, 1982). Wilson, Gaff, Dienst, Wood, & Bavry (1975) assert that differences in teaching style exist among faculty groupings of similar disciplines. They suggest such differences may reflect the field-centered strategies employed for pursuing truth. Most recently, Stark, Lowther, Bentley, and Martens found that a faculty member's discipline had a significant influence on course planning, including "content selection, arrangement, and conceptual integration" (1990, p. 162).

A second rationale for our focus emerges from the literature suggesting that college teaching may have an effect on the amount and kinds of student learning. In two recent reviews of research on college teaching, Pintrich (1988, 1989) infers from the classroom and experimental studies of academic learning tasks that course content and format--including course structure, types of assignments, and methods of evaluating student products--can influence student cognition and learning. Further, the social organization of learning tasks (Blumenfeld, Mergendoller, & Swarthout, 1987; Mosenthal, 1983) can encourage students to be self-directed and independent learners, to work cooperatively, or to be competitive. Finally, research suggests that course content (Malone, 1981; Corno & Mandinach, 1983), course goals (Eccles,

1983), and course format (Schunk, 1985; Findley & Cooper, 1983)--other likely factors in student learning--can affect student motivation.

Data Source/Method

We analyzed data from Faculty at Work, a survey conducted between November, 1987 and January, 1988 by the National Center for Research to Improve Postsecondary Teaching and Learning (NCRIPTAL). Faculty at Work gathered data on faculty members' perceptions of their institutions, their roles as teachers, and their beliefs about effective teaching. A total of thirty-two items focus on faculty members' instructional goals, beliefs, and teaching practices. Nine are concerned with faculty goals and expectations for classroom instruction (e.g., the "level of concern for demonstrating an intellectual, artistic, or scientific process"). Fourteen items center on faculty assumptions about students and optimal teaching-learning conditions (e.g., "Undergraduates share ideas and work cooperatively" and "Undergraduates learn best when students progress at their own pace"). Finally, nine items ask about faculty teaching practices in introductory courses (e.g., how often they "require use of a writing style manual, proper lab report format, etc.").

The stratified random sample of Faculty at Work is drawn in proportion to the actual national distribution of faculty across institutional types, from nine Carnegie Classification Categories (1976). Of the 8,130 faculty survey, 3,972 responded, for a response rate of 48.9 percent. The response rates for each institutional category appear below:

<u>Institutional Category</u>	<u>Response Rate</u>	<u>n</u>
Research Universities	47.0%	846
Doctoral Universities	46.8%	617
Comprehensive Colleges and Universities	52.2%	1,139
Liberal Arts Colleges	54.5%	460
Community Colleges	48.3%	857

Respondents were full-time faculty with regular appointments in eight liberal arts disciplines: history, English, biology, chemistry, mathematics, political science, psychology, and sociology. These eight disciplines were chosen to represent a cross-section of the liberal arts and sciences found at most colleges and universities.

Data Analysis and Results

We have analyzed the data in two phases. In the first phase, the goals, assumptions, and teaching practices of faculty in each of the five institutional categories were compared first across institutional categories (Table 1) and then with their disciplinary counterparts across institutional categories (Table 2). In addition, the goals, assumptions, and teaching practices of faculty in each discipline were first compared with their colleagues in the seven other disciplines irrespective of institutional type (Table 3) and then within institutional category (Table 4). These analyses provide insights into the differences between teaching perspectives and practices of faculty across institutional categories as well as across disciplines. Second, these same data were reanalyzed to determine whether discipline or institutional type is the stronger predictor of faculty goals, assumptions, and teaching practices (Table 5).

Faculty were compared on responses to ten single survey items and on five scales (see Figure 1). The five scales were constructed by grouping

survey items that measure the same theoretical construct. Scale 1--Teacher Emphasizes Writing and Research in Classroom encompasses five single items; Scale 2-- Teacher Engages in Formal Modes of Individualized Instruction consists of three single items; Scale 3--Students Lack Motivation, Scale 4--Students Are Independent Thinkers and Learners, and Scale 5--Teacher Should Control Course Content and Pace each are composed of two single items. For the items that comprise Scales 1 and 2, respondents were asked to indicate on a five-point Likert response scale ranging from "rarely" to "very often" the frequency with which they engaged in particular teaching activities. The response categories for the items included in Scales 3, 4, and 5 asked faculty to choose among four options ranging from strongly disagree to strongly agree to indicate their level of agreement with a statement (e.g., "I expect undergraduates will learn only what is required" and "I assume that undergraduate students learn best when course content is determined by the teacher." Each of the scales has a Cronbach's alpha of .60 or higher. The single items emphasized faculty members' goals for instruction (5 items), their assumptions about students (2 items), and their beliefs about optimal teaching and learning conditions (3 items). To indicate the importance of particular goals for instructions (e.g., "transmitting facts, principles, and theories of my discipline"), respondents chose among four response categories ranging from "slightly or not concerned" to "very highly concerned." To indicate their assumptions about students (e.g., "I expect undergraduate students will generally seek to outperform one another.") and their beliefs about optimal teaching and learning conditions (e.g., "I assume undergraduates learn best when competition among students is

fostered."), faculty employed a four response categories ranging from "strongly disagree" to "strongly agree".

First, the number of categories for analysis was reduced from the original nine Carnegie Classification Categories to five categories: Research Universities (Research I and II), Doctoral Universities (Doctoral I and II), Comprehensive Colleges and Universities (Comprehensive Colleges and Universities I and II), Liberal Arts Colleges (Liberal Arts Colleges I and II), and Community Colleges. One-way analysis of variance with Scheffe post-hoc comparisons were performed to determine if there were significant differences between institutions that comprise each of the institutional categories. The ANOVA and Scheffe comparisons indicated no inter-institutional differences within three categories (Liberal Arts Colleges, Comprehensive Colleges and Universities, and Community Colleges) and only three significant differences within each of the other two types (Research Universities and Doctoral Universities). Next, one-way ANOVAs, again with Scheffe post-hoc comparisons, were performed to identify differences among faculty on teaching goals, beliefs, and activities by both institutional type and disciplinary affiliation.

Comparisons of Faculty across Institutional Types. Two types of comparisons were made among faculty across the five institutional categories. First, all faculty in each institutional category were compared with their colleagues in the other categories. Then, discipline groups were compared across institutional categories. Fifty-four significant differences at $p < .05$ or higher emerged from the comparisons among faculty in the five institutional categories (see Table 1). There were no significant differences on four of the fifteen variables: Scale 4: Students Are Independent Thinkers and Learners, Scale 5: Teacher Should Control

Content and Pace, level of concern for transmitting facts, principles, and theories of the discipline, and level of concern for demonstrating an intellectual, artistic, or scientific process. Faculty differed most frequently on their concern with advancing students' socioeconomic status (8 significant differences), their concern with helping students improve their roles in society (7 significant differences), their belief that students need frequent feedback (7 significant differences), the extent to which they engage in formal modes of individualized instruction (7 significant differences), the extent to which they believe students compete with one another (6 significant differences), and their level of concern for students' personal development (6 significant differences). Faculty from research universities (25 significant differences) and community colleges (25 significant differences) differed most frequently from faculty in other institutional types.

Key differences centered on several variables¹. Faculty in research institutions are considerably less concerned than their counterparts in all other institutional categories with advancing students' socioeconomic status, helping students improve their roles in society, and helping students develop personally. On the other hand, faculty in community colleges are most concerned with the first two issues, while faculty in liberal arts colleges are most concerned with student personal development. Regarding their assumptions about students, faculty in research institutions are less convinced that students need frequent feedback and more adamant that students compete with one another than their colleagues in the other four institutional categories. Faculty in liberal arts institutions emphasize

¹ The variables highlighted here are those where at least three groups differed significantly.

writing and research and engage in formal modes of individualized instruction in their introductory classes more often than their colleges in other institutional categories. Faculty in community colleges engage least often in formal modes of individualized instruction.

Comparisons between discipline peers across the five institutional categories revealed significant differences among faculty from the same discipline but different institutions (see Table 2): English (significant differences on 8 scales or items), biology (8), mathematics/statistics (7), political science (7), psychology (6), history (5), chemistry (3), sociology (2). Faculty in mathematics/statistics, biology, and English differed most often with their colleagues in other institutional settings. Faculty in psychology and history differed on fewer items but more frequently in terms of the number of inter-institutional differences. Faculty in chemistry and sociology differed the least with their disciplinary colleagues in other institutional categories. There were no consistent patterns of differences by field--humanities, social sciences, and natural sciences; however, for the purpose of discussion, the disciplines are grouped together by field.

Humanities faculty in community colleges and research universities differed most often. English (see Table 2-English) and history (see Table 2--History) faculty in community colleges differ significantly from their peers in all other institutional categories in their greater concern for students' socioeconomic advancement. On the other hand, these faculty engage in fewer formal modes of individualized instruction in their introductory classes. Moreover, community college English faculty emphasize writing and research in their classes more than their counterparts in other institutional types. Research university English faculty emphasize writing and research in their classes less frequently, but

they and their colleagues in history engage more often in formal modes of individualized instruction.

Social science faculty in community colleges and research universities also differed most often from one another. Psychologists (see Table 2--Psychology) in community colleges demonstrated the greatest concern for students' personal development and with helping students improve their roles in society than their colleagues in other institutional categories. Community college psychology professors were also more convinced that students need frequent feedback than their colleagues in research, doctoral, and comprehensive institutions. Differing on just two items, the sociologists (see Table 2--Sociology) in community colleges were more concerned with advancing students' socioeconomic status than their colleagues in other institutional categories. Political scientists (see Table 2--Political Science) in research universities were significantly less concerned with advancing students socioeconomically, with helping them improve their roles in society, and with their personal development than their colleagues in at least two other institutional categories. Moreover, they were less convinced that students need frequent feedback than their colleagues in doctoral universities and community colleges.

Biology faculty (see Table 2--Biology) differed most often on their expectation that student will compete with one another. In this regard, biologists in research institutions and doctoral institutions differed most frequently with their colleagues in other institutional categories. Biologists in research institutions engage in formal modes of individualized instruction more frequently than their colleagues in three other institutional types, but they are less convinced that students need frequent feedback than their colleagues in comprehensive colleges and universities, liberal arts

colleges, and community colleges. Mathematics/statistics faculty (see Table 2--Mathematics/Statistics) in liberal arts colleges indicate a greater concern for students' personal development and engage more frequently in formal modes of individualized instruction than their colleagues in other institutional types. Mathematicians in research institutions are less concerned with helping students improve their roles in society and advance socioeconomically than their disciplinary colleagues. Chemistry faculty (see Table 2--Chemistry) in community colleges engage in significantly fewer formal modes of individualized instruction than their disciplinary colleagues in other institutional settings.

Comparisons among Faculty across Disciplines. One hundred nineteen significant differences at $p < .05$ or higher emerged from the comparisons among faculty across the eight disciplines (see Table 3). There were no significant differences on one of the fifteen variables: Scale 4: Students Are Independent Thinkers and Learners. Further, just two significant differences emerged on one scale and two items: the faculty members expectation that students lack interest and will learn only what is required (Scale 4), the faculty member's level of concern for students' personal development, and the faculty member's belief that students seek to outperform one another. There were more than 10 significant differences on six of the fifteen variables: Scale 1: Teacher Emphasizes Writing and Research (14 significant differences), students need frequent feedback (10), students learn best when course content is determined cooperatively by students and teacher (13), students learn best when students progress at their own pace (13), students learn best when competition is fostered (13), and Scale 5: Teacher should Control Course Content and Pace (11).

With regard to instructional goals, English faculty attach significantly less importance to transmitting facts, ideas, and theories of their discipline than all other discipline groups. Chemists, mathematicians, English faculty and biologists exhibited greater concern for advancing students socioeconomic status. Sociologists, English professors, and historians expressed more concern with students roles in society.

With respect to beliefs about students, English faculty differed significantly from faculty in all other disciplines except mathematics/statistics that students need frequent feedback on their performance. Mathematics/statistics faculty are more likely to believe that students lack interest and learn only what is required than psychologists and political scientists, while English faculty are less likely to perceive competition among students than chemists or biologists.

Faculty differ a great deal in their assumptions about optimal learning conditions for students. In general, faculty in the sciences as well as historians and political scientists indicated less confidence that students learn best when teacher and students determine course content cooperatively. Chemists and mathematicians were less likely than all others to accept the notion that optimal learning occurs when students are allowed to move at their own pace. English faculty and psychologists, on the other hand, were more likely to subscribe to this belief. Faculty in the sciences and political science were more convinced than their colleagues in the four other discipline groups that students learn best when competition is fostered. Psychologists and sociologists indicated less confidence than all other groups that optimal learning occurs when the teacher controls the course content and pace; nevertheless, all faculty indicate strong beliefs that students learn best when the teacher is in control.

Finally, regarding teaching practices, English faculty emphasized writing and research in classes more than all other discipline groups, while their colleagues in mathematics/statistics emphasized these activities less than all others. Further, mathematics/statistics faculty engaged least often in modes of individualized instruction when compared with all other discipline groups.

Comparisons among Faculty in Eight Disciplines within Institutional Categories. Comparisons among faculty in the different disciplines (see Table 4) revealed significant differences within each of the five institutional categories: research institutions (significant differences on 11 scales or items), doctoral institutions (5), comprehensive colleges and universities (10), liberal arts institutions (3), and community colleges (8). Moreover, there were more differences between discipline groups on these items and scales. Faculty across disciplines within research institutions, comprehensive colleges and universities, and community colleges differed more frequently than their counterparts in doctoral universities and liberal arts colleges. The greatest number of significant differences among discipline groups occurred with respect to Scale 1: Teacher Emphasizes Writing and Research.

Within research institutions (see Table 4--Research Institutions), mathematics/statistics faculty emphasized writing and research in introductory classes significantly less often than all other discipline groups, and they engaged in formal modes of individualized instruction significantly less often than all except the sociologists. Sociologists believe significantly more strongly that students learn better when students and their teachers determine course content cooperatively than their colleagues in mathematics/statistics, history, chemistry, and political science.

Psychologists believe significantly less strongly than chemists, mathematicians, and political scientists that students learn best when competition is encouraged. Mathematicians are significantly less concerned with helping students improve their roles in society than the historians, the sociologists, and the English faculty.

Within doctoral universities (see Table 4--Doctoral Institutions), mathematicians emphasized writing and research in their classes significantly less often than all other discipline groups except chemists. English faculty emphasized these activities significantly more than all other discipline groups except political scientists.

Within comprehensive colleges and universities (see Table 4--Comprehensive Institutions), the mathematics faculty emphasized writing and research in their introductory classes significantly less often than the faculty in all other discipline groups, while the English faculty focused on these activities significantly more often than all others. Chemists were less convinced that students learn best when they progress at their own pace than faculty in psychology, political science, English, and sociology. Sociologists and English faculty were significantly more convinced of the value of self-paced instruction than chemists, mathematicians, and biologists.

Within liberal arts institutions (see Table 4--Liberal Arts Institutions), mathematicians emphasized writing significantly less than all other faculty except chemists. On the other hand, English faculty emphasized these activities more than all others except sociologists and political scientists.

Finally, within community colleges (see Table 4--Community Colleges), mathematics faculty emphasized writing significantly less than

all other faculty; English faculty emphasized writing more than all other faculty. Moreover, history faculty emphasized writing significantly more than mathematics, chemistry, and biology faculty. Chemists believed less strongly than biologists, psychologists, English faculty, and sociologists that students learn best when the teacher and students determine course content cooperatively. Finally, English faculty were significantly less concerned than their colleagues in history, biology, psychology, mathematics, and chemistry about transmitting the facts, principles, and theories of their disciplines.

Assessment of Institutional Category and Discipline as Predictors of Teaching Goals, Beliefs, and Behaviors.

In order to investigate the relative impact of discipline and institutional context variables on teaching goals, beliefs, and practices, the institution and discipline indices were recoded as dummy variables. Institutional category and discipline were then hierarchically regressed on seven of the teaching goals, assumptions, and practices (outcome) variables in two stages. The dependent variables were ones where significant differences were found between at least three institutional categories or between at least three discipline groups (see Table 5). Stage 1 entered institutional type as step 1 followed by discipline as step 2; Stage 2 reversed the order of Stage 1. R-squared values from the second step of each stage were compared. The results (Table 5) represent the relative strengths (r-squared changes) of each variable after controlling for the effects of the other.

As can be seen from Table 5, the relative strengths of discipline and institutional category on teaching goals and behaviors varies widely according to which particular variable is of interest. These results reflect

real disciplinary and institutional category differences; however, the extreme simplicity of the regression equations, coupled with the small r -squared values, indicate that the reader should exercise caution in interpretation. The relative differences in the magnitudes of r -squared change seldom exceeded an absolute value of two percent. Clearly, neither institutional category nor discipline is the primary determinant of faculty teaching goals, assumptions, and practices.

Discussion

The analyses outlined above suggests that faculty in all institutional categories irrespective of discipline have as their major instructional goal the transmission of the facts, principles, and theories of their disciplines. Only slightly less important is the demonstration of an intellectual, artistic, or scientific process. Beyond those goals, however, the faculty split across institutional lines. Faculty in the research and doctoral institutions are significantly less interested than their colleagues in the comprehensive colleges and universities and the community colleges in emphasizing all three instructional goals that focus on improving students' lives in a "non-intellectual" way. Several explanations of these differences may be plausible. An interest in encouraging students' personal development and helping them to improve their social roles and socioeconomic status is likely to be part of the missions of the comprehensive institutions and community colleges. Faculty with such interests may be attracted to institutions with such missions. Or, faculty may be recruited on the basis of their expressed willingness to attend to these concerns. Still another explanation may be that faculty are socialized by these institutions to accept these values and concerns after they have accepted their appointments. Earlier findings, however, suggest that faculty in these institutional settings

have not been pressured either to teach or to evaluate their students' work in particular ways (Lawrence, Blackburn, Trautvetter, and Pitney, 1988).

Regarding instructional goals, faculty in liberal arts colleges are different from their colleagues in the research and doctoral institutions in their concern for students' personal development and their interest in helping students improve their social roles. They also lack the comprehensive institution and community college faculty members' concern for improving students' socioeconomic status. Again, an interest in students' personal development and, in many cases, the development of their social roles certainly fits with the missions of most liberal arts colleges. Less attention to socioeconomic improvement as reflected in vocational programs, on the other hand, is likely to be the norm. The major question again becomes: What is the origin of these differences in instructional goals?

Regarding their assumptions about optimal student learning conditions, all faculty favor teacher control of course content and pace, and predictably, they are not particularly enthusiastic about the prospect of students' determining course content cooperatively or about learning situations that allow students to learn at their own pace. Among the disciplines there is disagreement about the value of competition among students as a means of enhancing learning: the hard scientists in research institutions favor competitive situations the most. One explanation for this difference may derive from the nature of the disciplines themselves, differences that may lend themselves to competition among students. This situation may be particularly prevalent in research institutions where students in the undergraduate chemistry, math, and biology courses may be particularly motivated by competition because of their desire to make top

grades to gain entry to medical schools or other highly competitive graduate programs. Despite these small differences, however, faculty generally believe that students learn best when their instructor decides what and how students are to learn.

In their assumptions about undergraduate students, faculty are, for the most part, quite positive: students think for themselves, work on their own, and they are also fairly well-motivated. Faculty in the research and doctoral institutions see students as more competitive and less in need of frequent feedback, a perception that is particularly strong among the scientists in those institutional categories. Again, these perceptions may arise from the highly competitive nature of the students in undergraduate math, chemistry, and biology classes in those institutions where such courses serve a "gatekeeper" role, determining the difference between going on to medical school or one of the "better" graduate schools.

Variations in teaching practices emerge on the writing variable primarily from the extreme differences contributed by English and mathematics/statistics faculty. Across institutional types, English faculty do the most writing and research in their introductory courses. This outcome was anticipated since English composition or a combination of composition and literature typically makes up the English curriculum at the introductory level. In all other disciplines, except mathematics/statistics, faculty report involving students in a moderate amount of writing and research activities. Mathematics/statistics faculty, on the other hand, indicate that on the average they seldom involve students in these activities. These findings indicate that mathematics/statistics faculty have not been affected either by the efforts to improve writing across the curriculum or that they are aware of the findings from current educational and

psychological research that suggest that writing may be an effective way to help students learn mathematics and statistics.

Differences in the extent to which faculty members engage in formal modes of individualized instruction arise to a large extent across institutional categories. Community college faculty, regardless of discipline, report low frequencies of these activities. This finding may have occurred for several reasons. For example, many community colleges do not expect faculty to involve themselves in tutorial activities with their students; instead, these institutions provide tutorial services through a centralized learning center. In addition, one of the individual items that made up this scale specified the use of "research" internships. Since internships at community colleges are not likely to be focused on research but rather on offering practical and on-the-job experiences, community college faculty may have reported low frequencies on this item as well.

On the other hand, faculty in research universities and liberal arts colleges report more formal individualized instruction activities at the introductory course level. Although these levels are significantly higher than in other institutional types, it is important to realize that the higher levels reported here do not indicate that any of these faculty engage in individualized instruction to a great extent. Differences are almost non-existent across disciplinary lines. In any case, that faculty in research universities may engage more in formal modes of individualized instruction may be due to their view that many introductory courses offer opportunities for recruiting potential majors who they may cull from the larger group based on their performance. Moreover, certain programs, for example, pre-medical may require students to participate in research

internships, tutorials, or individualized instruction that these faculty may supervise. Or, students may voluntarily engage more frequently in these activities in the sciences because these experiences may give them an edge in admissions. In the liberal arts colleges, faculty may also see introductory courses as offering recruitment opportunities, but they may also engage in more individualized instruction because of the emphasis on the development of the individual in the mission of those institutions.

Generally speaking, there may be a few lessons from these data to be learned by the director of faculty development efforts. In certain kinds of institutions, for example, liberal arts colleges, it may be possible to initiate activities for all faculty without special attention to the disciplines. On the other hand, since greater differences exist within the research and doctoral institutions where faculty may be more deeply involved in the specialty areas within their disciplines, faculty development activities for teaching may be more effective if they are designed with a particular disciplinary background in mind. In addition to the questions raised earlier, these data raise a number of additional questions for further research. How do faculty goals and assumptions about students and optimal learning situations affect a variety of other types of instructional decisions such as the use of particular teaching activities that promote problem-solving or critical thinking? How do these variables affect the kinds of assignments and examinations that faculty members employ?

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Figure 1: Summary of Single Items and Scales

Single Items

Question stem: Indicate whether you strongly disagree, tend to disagree, tend to agree, strongly agree with the following:

- Item 1:** I expect undergraduate students will generally seek to outperform one another.
- Item 2:** I expect undergraduate students need frequent feedback on their performance.
- Item 3:** I assume undergraduates learn best when course content is determined cooperatively by students and the teacher.
- Item 4:** I assume undergraduates learn best when competition among students is fostered.
- Item 5:** I assume undergraduates learn best when students progress at their own pace.

Question stem: As a teacher, indicate whether you are slightly or not concerned, somewhat concerned, moderately concerned, very highly concerned with the following:

- Item 6:** transmitting facts, principles, and theories of my discipline.
- Item 7:** helping students to improve and make the most of their roles in society.
- Item 8:** demonstrating an intellectual, artistic, or scientific process.
- Item 9:** encouraging students' overall personal development.
- Item 10:** having students advance their socioeconomic status.

Scales

Question stem: In a basic introductory course you teach on a regular basis, how frequently (rarely, seldom, occasionally, often, very often) do you

- Scale 1: Teacher Emphasizes Writing and Research in Classes**
 - require use of a writing style manual, proper lab format, etc.
 - require annotated bibliographies or documented laboratory reports, etc.
 - have students conduct on-line searches for their research projects.
 - require a research paper as part of your class.
 - critically review the rough draft of the students' major papers or reports.

- Scale 2: Teacher Engages in Formal Modes of Individual Instruction**
 - supervise independent study programs.
 - design research internship experience for students.
 - supervise tutorials.

Question stem: I expect undergraduate students will generally

- Scale 3: Students Lack Motivation**
 - learn only what is required.
 - lack interest in the subject matter.
- Scale 4: Students Are Independent Thinkers and Learners**
 - think for themselves.
 - work on their own.

Question stem: I assume that undergraduate students learn best when

- Scale 5: Teacher Should Control Course Content and Pace**
 - course content is determined by the teacher.
 - pace is set for the group by the teacher.

Table 1
Inter-Institutional Differences in
Teaching Practices, Assumptions, and Goals

			Research Institutions		Doctoral Institutions		Comprehensive Institutions		Liberal Arts Institutions		Community Colleges	
	F	p	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Instructional Goals												
Teacher concern with students' personal development	43.60	.0000	abc 2.78	.94	def 2.87	.92	ad 3.13	.83	cf 3.28	.83	be 3.20	.84
Teacher concern with students' roles in society	43.23	.0000	abcd 2.89	.92	acfg 3.05	.91	beh 3.22	.82	cf 3.29	.84	dgh 3.38	.78
Teacher concern with advancing students' socioeconomic status	96.03	.0000	abc 1.65	.78	de 1.79	.83	bdifh 2.03	.89	afg 1.85	.88	cegh 2.42	.96
Assumptions Regarding Teaching and Learning Conditions												
Best learning occurs when teacher and students determine course content cooperatively	7.20	.0000	ab 2.03	.79		.80		.80	b 2.24	.77	a 2.20	.80
Best learning occurs when students progress at their own pace	8.05	.0000	c 2.32	.73	b 2.31	.73	a 2.26	.77		.76	abc 2.45	.80
Best learning occurs when competition is fostered	4.01	.0030	a 2.16	.76		.75	a 2.28	.77		.72		.77
Assumptions Regarding Students												
Students lack interest and learn only what is required	5.78	.0001	b 2.58	.64		.66		.68	a 2.56	.65	ab 2.71	.65
Students compete with one another	31.32	.0000	bdf 2.80	.65	ace 2.71	.69	cl 2.54	.69	ef 2.55	.66	ab 2.47	.66
Students need frequent feedback	32.57	.0000	abcd 3.04	.63	acf 3.15	.59	bg 3.23	.59	ce 3.28	.58	dfg 3.36	.61
Teaching Practices												
Teacher emphasizes writing and research in classes	8.19	.0000	a 2.47	(1.07)	b 2.53	(1.12)	c 2.57	(1.11)	abcd 2.84	(1.08)	d 2.58	(1.16)
Teacher engages in formal modes of individualized instruction	43.64	.0000	ce 2.44	(1.08)	bg 2.29	(1.03)	acf 2.21	(.95)	dfg 2.52	(1.05)	abd 1.90	(.82)

Table 1 (continued)

			Research Institutions		Doctoral Institutions		Comprehensive Institutions		Liberal Arts Institutions		Community Colleges	
	F	p	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Non-significant Factors												
Students are independent thinkers and learners	1.66	.1556	2.66	.60	2.67	.62	2.62	.65	2.69	.65	2.63	.61
Best learning occurs when teacher sets content/pace	1.22	.3011	3.15	.55	3.20	.54	3.20	.56	3.17	.57	3.17	.56
Teacher concern about transmitting facts of discipline	1.52	.1931	3.76	.51	3.74	.54	3.73	.54	3.75	.50	3.70	.59
Teacher concern about demonstrating a process	.57	.6852	3.45	.73	3.41	.75	3.44	.71	3.41	.74	3.41	.74

Letters in superscript indicate institutional pairs that differ at .05 or greater.
 Higher mean—stronger concern or agreement and more frequent engagement

Table 2
Inter-Institutional Differences Within Disciplines

			Research Institutions		Doctoral Institutions		Comprehensive Institutions		Liberal Arts Institutions		Community Colleges	
	F	p	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Chemistry												
Teacher concern with students' personal development	5.64	.0002	a 2.82	(.88)	b 2.85	(.91)	ab 3.28	(.78)	3.20	(.76)	3.03	(.83)
Teacher concern with students' roles in society	6.14	.0001	ab 2.68	(.85)	3.08	(.83)	b 3.21	(.84)	a 3.18	(.75)	3.02	(.94)
Students need frequent feedback	2.87	.0230	a 3.06	(.60)	3.14	(.63)	3.24	(.62)	3.24	(.62)	a 3.37	(.52)
Teacher engages in formal modes of individualized instruction	5.97	.0001	a 2.35	(1.02)	b 2.39	(.98)	c 2.43	(1.01)	d 2.60	(1.04)	abcd 1.76	(.71)
Mathematics/Statistics												
Teacher concern with students' personal development	13.20	.0000	abc 2.60	(1.00)	def 2.69	(.93)	adg 3.08	(.84)	cfg 3.50	(.78)	be 3.12	(.82)
Teacher concern with students' roles in society	12.37	.0000	abcd 2.47	(1.07)	a 2.94	(1.03)	b 3.13	(.80)	d 3.35	(.77)	c 3.23	(.83)
Teacher concern with advancing students' socioeconomic status	16.88	.0000	ab 1.74	(.82)	c 1.87	(.88)	d 2.08	(.88)	a 2.27	(.91)	bcd 2.60	(.92)
Best learning occurs when teacher sets course content/pace	3.27	.0115	ab 3.01	(.56)	b 3.26	(.50)	a 3.24	(.52)	3.15	(.53)	3.22	(.52)
Students compete with one another	5.58	.0002	ab 2.88	(.62)	2.67	(.66)	a 2.50	(.60)	2.57	(.64)	b 2.53	(.62)
Teacher emphasizes writing and research in classes	7.66	.0000	ab 1.34	(.45)	1.67	(.76)	a 1.72	(.72)	bc 1.88	(.81)	c 1.49	(.65)
Teacher engages in formal modes of individualized instruction	5.85	.0001	a 1.70	(.86)	c 1.85	(.72)	1.98	(.71)	abc 2.26	(.84)	b 1.81	(.73)
Biology												
Teacher concern with students' personal development	2.80	.0259	a 2.87	(.0)	3.08	(.86)	a 3.20	(.81)	3.11	(.84)	3.16	(.83)
Teacher concern with students' roles in society	7.18	.0000	ab 2.84	(.93)	3.20	(.90)	a 3.20	(.81)	3.08	(.93)	b 3.43	(.74)

Table 2 (continued)

			Research Institutions		Doctoral Institutions		Comprehensive Institutions		Liberal Arts Institutions		Community Colleges	
	F	p	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Biology (continued)												
Teacher concern with advancing students' socioeconomic status	8.36	.0000	ab 1.73	(.89)	1.91	(.85)	a 2.22	(.90)	1.92	(1.01)	b 2.34	(.96)
Best learning occurs when students progress at their own pace	3.08	.0200	2.10	(.66)	2.24	(.77)	a 2.12	(.73)	2.30	(.64)	a 2.42	(.73)
Students compete with one another	13.25	.0000	bdf 3.00	(.53)	ace 2.98	(.69)	ef 2.64	(.66)	cd 2.56	(.67)	ab 2.50	(.65)
Students need frequent feedback	5.23	.0004	abc 2.97	(.63)	3.14	(.55)	a 3.20	(.51)	c 3.34	(.51)	b 3.24	(.65)
Teacher emphasizes writing and research in classes	5.35	.0003	a 2.64	(1.07)	2.45	(1.07)	2.47	(1.08)	b 2.90	(1.12)	ab 2.17	(.88)
Teacher engages in formal modes of individualized instruction	18.75	.0000	def 2.88	(.99)	bf 2.36	(1.02)	ae 2.25	(.94)	c 2.60	(1.04)	abcd 1.80	(.76)
Psychology												
Teacher concern about demonstrating a process	4.16	.0026	a 3.53	(.62)	3.26	(.82)	3.33	(.67)	a 3.07	(.83)	3.31	(.71)
Teacher concern with students' personal development	8.83	.0000	ab 2.67	(.90)	c 2.73	(.94)	d 2.96	(.88)	a 3.22	(.81)	bcd 3.38	(.86)
Teacher concern with students' roles in society	8.22	.0000	a 2.84	(.87)	b 2.84	(.84)	c 3.03	(.86)	3.26	(.77)	abc 3.48	(.76)
Teacher concern with advancing students' socioeconomic status	4.13	.0027	b 1.65	(.74)	a 1.60	(.74)	1.76	(.81)	1.65	(.90)	ab 2.06	(.83)
Students need frequent feedback	6.92	.0000	b 3.09	(.59)	a 3.06	(.65)	c 3.18	(.60)	3.22	(.55)	abc 3.53	(.59)
Teacher engages in formal modes of individualized instruction	5.60	.0002	a 2.51	(1.20)	b 2.45	(1.07)	2.13	(.98)	2.40	(1.18)	ab 1.83	(.80)
Sociology												
Teacher concern with students' personal development	4.66	.0012	a 2.81	(.88)	2.78	(.90)	3.10	(.86)	3.25	(.74)	a 3.31	(.82)
Teacher concern with advancing students' socioeconomic status	9.85	.0000	ab 1.64	(.73)	d 1.78	(.86)	a 2.16	(.98)	c 1.78	(.86)	bcd 2.51	(1.00)

Table 2 (continued)

			Research Institutions		Doctoral Institutions		Comprehensive Institutions		Liberal Arts Institutions		Community Colleges	
	F	p	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Political Science												
Teacher concern with students' personal development	7.14	.0000	ab 2.53	(.97)	2.88	(.90)	a 3.16	(.89)	b 3.27	(.74)	3.03	(.86)
Teacher concern with students' roles in society	4.98	.0007	ab 2.84	(.92)	2.98	(.94)	a 3.30	(.81)	b 3.43	(.83)	3.26	(.74)
Teacher concern with advancing students' socioeconomic status	7.53	.0000	ab 1.49	(.71)	c 1.69	(.83)	a 1.91	(.84)	1.70	(.60)	bc 2.31	(1.05)
Students compete with one another	2.93	.0213	a 2.80	(.73)	2.77	(.73)	a 2.47	(.69)	2.62	(.62)	2.66	(.65)
Students need frequent feedback	4.76	.0010	ab 2.78	(.75)	a 3.13	(.60)	3.02	(.60)	3.21	(.62)	b 3.21	(.64)
Teacher emphasizes writing and research in classes	3.44	.0092	b 2.49	(.97)	2.74	(1.09)	2.51	(1.04)	ab 3.17	(.81)	a 2.38	(.93)
Teacher engages in formal modes of individualized instruction	4.64	.0012	a 2.52	(1.04)	2.43	(1.22)	2.20	(.97)	b 2.76	(1.26)	ab 1.80	(.74)
English												
Teacher concern with students' personal development	4.68	.0010	3.12	(.86)	ab 2.91	(.93)	3.19	(.79)	b 3.40	(.84)	a 3.24	(.86)
Teacher concern with students' roles in society	7.58	.0000	b 3.16	(.81)	a 3.00	(.92)	3.29	(.82)	3.25	(.93)	ab 3.48	(.76)
Teacher concern with advancing students' socioeconomic status	31.98	.0000	ab 1.59	(.76)	c 1.75	(.75)	ae 2.00	(.88)	d 1.76	(.83)	bode 2.51	(.97)
Students lack interest and learn only what is required	4.69	.0010	a 2.47	(.62)	2.61	(.67)	2.63	(.69)	2.61	(.61)	a 2.78	(.67)
Best learning occurs when students progress at their own pace	3.66	.0058	2.48	(.75)	a 2.40	(.70)	b 2.45	(.77)	2.50	(.81)	ab 2.68	(.82)
Students need frequent feedback	7.37	.0000	b 3.20	(.59)	a 3.20	(.66)	3.36	(.58)	3.35	(.67)	ab 3.50	(.57)

Table 2 (continued)

			Research Institutions		Doctoral Institutions		Comprehensive Institutions		Liberal Arts Institutions		Community Colleges	
	F	p	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
English (continued)												
Teacher emphasizes writing and research in classes	12.46	.0000	2.96 ^{abc}	(.95)	3.25 ^d	(.98)	3.34 ^{ae}	(.91)	3.52 ^b	(.79)	3.62 ^{cde}	(.86)
Teacher engages in formal modes of individualized instruction	10.99	.0000	2.57 ^c	(1.08)	2.26	(1.02)	2.27 ^a	(.97)	2.56 ^b	(1.04)	1.95 ^{abc}	(.88)
History												
Teacher concern with students' personal development	5.10	.0005	2.67 ^{ab}	(1.05)	3.07	(.86)	3.07 ^a	(.87)	3.14	(1.02)	3.22 ^b	(.79)
Teacher concern with students' roles in society	3.13	.0149	3.01 ^a	(.96)	3.30	(.79)	3.30	(.82)	3.33	(.86)	3.41 ^a	(.75)
Teacher concern with advancing students' socioeconomic status	13.33	.0000	1.51 ^{ab}	(.66)	1.88 ^d	(.90)	1.96 ^{ae}	(.85)	1.63 ^c	(.66)	2.35 ^{bcd}	(.98)
Students compete with one another	5.46	.0003	2.79 ^{ab}	(.62)	2.74	(.67)	2.50 ^b	(.76)	2.46	(.61)	2.43 ^a	(.65)
Teacher engages in formal modes of individualized instruction	6.61	.0000	2.45 ^{bd}	(1.05)	2.38 ^a	(1.11)	2.01 ^{cd}	(.87)	2.51	(1.02)	1.90 ^{abc}	(.88)

Letters in superscript indicate institutional pairs that differ at .05 or greater. Higher mean—stronger concern or agreement and more frequent engagement

Table 3
Inter-Disciplinary Differences in
Teaching Practices, Assumptions, and Goals

			Chemistry		Math/Stat		Biology		Psychology		Sociology		Polit Science		English		History	
	F	p	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Instructional Goals																		
Teacher concern with students' personal development	4.99	.0000	3.05	(.85)	3.01	(.91)	3.09	(.85)	2.93 ^b	(.92)	3.01	(.88)	3.17 ^a	(.94)	2.91 ^{ab}	(.86)	3.01	(.93)
Teacher concern with students' roles in society	7.92	.0000	3.02 ^{abc}	(.87)	3.06 ^g	(.93)	3.15	(.87)	3.03 ^{def}	(.87)	3.28 ^{cf}	(.82)	3.11	(.89)	3.28 ^{beg}	(.84)	3.26 ^{ad}	(.85)
Teacher concern with advancing students' socioeconomic status	13.28	.0000	2.06 ^{cg}	(.91)	2.18 ^{dhi}	(.94)	2.06 ^{bf}	(.95)	1.72 ^{abcd}	(.80)	1.95	(.93)	1.77 ^{efgh}	(.84)	2.03 ^{ae}	(.94)	1.87 ⁱ	(.87)
Teacher concern about transmitting facts of discipline	25.12	.0000	3.86 ^{ghi}	(.38)	3.83 ^e	(.46)	3.83 ^f	(.43)	3.77 ^d	(.47)	3.75 ^c	(.48)	3.69 ^{ah}	(.53)	3.53 ^{abcdefg}	(.73)	3.72 ^{bi}	(.54)
Teacher concern about demonstrating a process	8.07	.0000	3.50 ^b	(.70)	3.52 ^{dfig}	(.68)	3.51 ^{ce}	(.65)	3.34 ^g	(.72)	3.37	(.68)	3.26 ^{abcd}	(.83)	3.48 ^a	(.74)	3.32 ^{ef}	(.83)
Assumptions Regarding Teaching and Learning Conditions																		
Best learning occurs when teacher and students determine course content cooperatively	18.93	.0000	1.87 ^{abc}	(.70)	2.01 ^{def}	(.73)	2.06 ^{jkl}	(.78)	2.26 ^{adgj}	(.76)	2.38 ^{cfilm}	(.82)	2.09 ^m	(.78)	2.26 ^{behk}	(.84)	2.04 ^{ghi}	(.80)
Best learning occurs when students progress at their own pace	23.54	.0000	2.05 ^{abcdef}	(.72)	2.16 ^{ghij}	(.74)	2.24 ^{akl}	(.72)	2.48 ^{eik}	(.72)	2.43 ^{dh}	(.73)	2.38 ^{cg}	(.73)	2.52 ^{fjlm}	(.78)	2.33 ^{bm}	(.79)
Best learning occurs when competition is fostered	22.71	.0000	2.44 ^{dfjl}	(.77)	2.46 ^{egkm}	(.73)	2.30 ^{bh}	(.76)	2.01 ^{abcde}	(.69)	2.11 ^{fg}	(.72)	2.32 ^{ci}	(.80)	2.11 ^{hijk}	(.74)	2.23 ^{alm}	(.76)
Best learning occurs when teacher sets content/pace	9.20	.0000	3.28 ^{fk}	(.53)	3.20 ^a	(.53)	3.23 ^{ej}	(.54)	3.07 ^{ghijk}	(.53)	3.02 ^{abcdef}	(.56)	3.22 ^{di}	(.56)	3.20 ^{bg}	(.58)	3.21 ^{ch}	(.58)

Table 3 (continued)

			Chemistry		Math/Stat		Biology		Psychology		Sociology		Polit Science		English		History	
	F	p	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Assumptions Regarding Students																		
Students lack interest and learn only what is required	3.91	.0003	2.67	(.68)	^{ab} 2.74	(.66)	2.66	(.60)	^b 2.56	(.62)	2.59	(.67)	^a 2.54	(.71)	2.64	(.67)	2.63	(.68)
Students compete with one another	6.62	.0000	^a 2.70	(.66)	2.60	(.63)	^b 2.73	(.67)	2.61	(.66)	2.62	(.71)	2.66	(.71)	^{ab} 2.49	(.70)	2.60	(.69)
Students need frequent feedback	14.92	.0000	^{bj} 3.20	(.61)	^{ce} 3.29	(.57)	^h 3.17	(.59)	^{ai} 3.19	(.62)	^g 3.13	(.57)	^{abcd} 3.01	(.67)	^{dfghij} 3.35	(.61)	^{ef} 3.12	(.61)
Teaching Practices																		
Teacher emphasizes writing and research in classes	151.66	.0000	^{ahi} 2.33	(.93)	^{abdefg} 1.61	(.70)	^{ck} 2.49	(1.06)	^{bj} 2.49	(1.18)	^{dl} 2.59	(1.11)	^{em} 2.60	(1.01)	^{gijklmn} 3.37	(.93)	^{fm} 2.63	(1.04)
Teacher engages in formal modes of individualized instruction	10.85	.0000	^e 2.33	(1.00)	^{abdefg} 1.90	(.77)	^g 2.34	(1.00)	^c 2.27	(1.07)	^d 2.30	(1.05)	^f 2.34	(1.07)	^b 2.25	(1.00)	^a 2.22	(1.00)
Non-significant Factors																		
Students are independent thinkers and learners	2.74	.0077	2.68	(.61)	2.61	(.58)	2.69	(.59)	2.66	(.58)	2.67	(.62)	2.75	(.68)	2.60	(.68)	2.61	(.63)

Letters in superscript indicate institutional pairs that differ at .05 or greater.
Higher mean—stronger concern or agreement and more frequent engagement

Table 4:
Discipline Differences Within Institutional Categories

			Chemistry		Math		Biology		Psychology		Sociology		Political Science		English		History	
Variable	F	p	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Research Institutions																		
Teacher concern about transmitting facts of discipline	4.26	.0001	3.88 ^b	(.39)	3.83	(.50)	3.82	(.41)	3.84 ^a	(.39)	3.77	(.45)	3.68	(.58)	3.58 ^{ab}	(.68)	3.73	(.55)
Teacher concern with students' personal development	4.47	.0001	2.82	(.88)	2.60 ^b	(1.00)	2.87	(.90)	2.67	(.90)	2.81	(.88)	2.53 ^a	(.97)	3.12 ^{ab}	(.86)	2.67	(1.05)
Teacher concern with students' roles in society	6.04	.0000	2.68 ^d	(.85)	2.47 ^{abc}	(1.07)	2.84	(.93)	2.84	(.87)	3.11 ^b	(.84)	2.84	(.92)	3.16 ^{cd}	(.81)	3.01 ^a	(.96)
Best learning occurs when teacher sets course content/pace	7.14	.0000	3.34 ^{bde}	(.49)	3.01 ^e	(.56)	3.17	(.54)	2.98 ^{cd}	(.52)	2.96 ^{ab}	(.48)	3.26	(.51)	3.20	(.61)	3.27 ^{ac}	(.55)
Best learning occurs when teacher and student determine course content cooperatively	7.20	.0000	1.83 ^d	(.69)	1.79 ^a	(.71)	2.03	(.79)	2.20	(.71)	2.34 ^{acde}	(.87)	1.90 ^e	(.76)	2.21 ^b	(.89)	1.82 ^{bc}	(.64)
Best learning occurs when students progress at their own pace	5.50	.0000	2.02 ^{ab}	(.63)	2.22	(.73)	2.21	(.66)	2.53 ^b	(.74)	2.39	(.73)	2.28	(.68)	2.48 ^a	(.75)	2.36	(.80)
Students compete with one another	3.62	.0008	2.83	(.63)	2.88	(.62)	3.00 ^a	(.53)	2.71	(.59)	2.79	(.71)	2.80	(.73)	2.61 ^a	(.70)	2.80	(.62)
Best learning occurs when competition is fostered	5.96	.0000	2.37 ^a	(.77)	2.39 ^b	(.84)	2.23	(.69)	1.96 ^{abc}	(.69)	2.07	(.68)	2.41 ^{cd}	(.79)	2.01 ^d	(.73)	2.09	(.76)
Students need frequent feedback	4.79	.0000	3.06	(.60)	3.21 ^b	(.60)	2.97	(.63)	3.10	(.59)	3.03	(.57)	2.78 ^a	(.75)	3.20 ^{ab}	(.59)	2.99	(.64)
Teacher emphasizes writing and research in classes	20.53	.0000	2.26 ^{ah}	(.97)	1.34 ^{abcdefg}	(.45)	2.64 ^e	(1.07)	2.51 ^d	(1.21)	2.50 ^c	(1.02)	2.49 ^b	(.97)	2.96 ^{gh}	(0.95)	2.68 ^f	(1.00)
Teacher engages in formal modes of individualized instruction	9.12	.0000	2.37 ^a	(1.02)	1.70 ^{ahcdef}	(.86)	2.88 ^{fg}	(.99)	2.51 ^c	(1.20)	2.23 ^g	(.99)	2.52 ^d	(1.04)	2.57 ^e	(1.08)	2.45 ^b	(1.05)

Table 4 (continued)

			Chemistry		Math		Biology		Psychology		Sociology		Political Science		English		History	
Variable	F	p	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Doctoral Institutions																		
Teacher concern about transmitting facts of discipline	4.98	.0000	b 3.86	(.35)	c 3.89	(.38)	a 3.83	(.41)	3.70	(.55)	3.75	(.52)	3.79	(.41)	abc 3.51	(.77)	3.70	(.53)
Students compete with one another	3.39	.0015	2.83	(.61)	2.67	(.66)	a 2.98	(.69)	2.69	(.69)	2.56	(.73)	2.77	(.73)	a 2.53	(.69)	2.74	(.67)
Best learning occurs when competition is fostered	4.68	.0000	b 2.55	(.78)	ac 2.52	(.68)	2.26	(.83)	c 2.09	(.71)	2.22	(.70)	2.30	(.76)	ab 2.07	(.71)	2.31	(.75)
Teacher emphasizes writing and research in classes	18.10	.0000	g 2.27	(1.01)	abdef 1.67	(.76)	bi 2.45	(1.07)	cj 2.50	(1.12)	ah 2.43	(1.05)	e 2.74	(1.09)	fghijk 3.25	(.98)	dk 2.67	(1.15)
Teacher engages in formal modes of individualized instruction	3.02	.0040	2.39	(.98)	a 1.85	(.72)	2.36	(1.02)	a 2.45	(1.07)	2.25	(1.07)	2.43	(1.22)	2.26	(1.02)	2.38	(1.11)

Table 4 (continued)

	Chemistry				Math		Biology		Psychology		Sociology		Political Science		English		History	
Variable	P	p	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Comprehensive Institutions																		
Teacher concern about transmitting facts of discipline	4.85	.0000	3.86 ^b	(.39)	3.76	(.54)	3.83 ^a	(.45)	3.75	(.51)	3.71	(.53)	3.71	(.48)	3.57 ^{ab}	(.68)	3.72	(.52)
Teacher concern about demonstrating a process	4.03	.0002	3.54	(.67)	3.47	(.70)	3.57 ^a	(.58)	3.33	(.67)	3.41	(.64)	3.21 ^a	(.84)	3.52	(.72)	3.30	(.87)
Teacher concern with advancing students' socioeconomic status	4.73	.0000	2.24 ^b	(.94)	2.08	(.88)	2.22 ^a	(.90)	1.76	(.81)	2.16	(.98)	1.91	(.84)	2.00	(.88)	1.96	(.85)
Best learning occurs when teacher sets course content/pace	2.84	.0062	3.21	(.58)	3.24	(.52)	3.31 ^a	(.53)	3.13	(.56)	3.01	(.57)	3.19	(.60)	3.18	(.60)	3.25	(.55)
Best learning occurs when teacher and students determine course content cooperatively	5.18	.0000	1.98	(.71)	2.01	(.74)	1.96 ^{ab}	(.78)	2.24	(.78)	2.40 ^b	(.80)	2.11	(.76)	2.27 ^a	(.84)	2.04	(.87)
Best learning occurs when students progress at their own pace	9.12	.0000	1.99 ^{abcd}	(.66)	2.05 ^{ef}	(.76)	2.12 ^{gh}	(.73)	2.36 ^a	(.71)	2.52 ^{dih}	(.76)	2.40 ^b	(.76)	2.45 ^{ceg}	(.77)	2.22	(.81)
Best learning occurs when competition is fostered	6.25	.0000	2.46 ^c	(.79)	2.44 ^b	(.71)	2.41 ^a	(.77)	2.00 ^{abc}	(.70)	2.11	(.74)	2.28	(.78)	2.22	(.78)	2.32	(.80)
Students need frequent feedback	4.04	.0002	3.24	(.62)	3.30	(.56)	3.20	(.51)	3.18	(.60)	3.15	(.60)	3.02 ^a	(.60)	3.36 ^a	(.58)	3.22	(.59)
Teacher emphasizes writing and research in classes	35.18	.0000	2.44 ^{bi}	(.92)	1.72 ^{abcdefg}	(.72)	2.47 ^{cj}	(1.08)	2.54 ^{ei}	(1.23)	2.61 ^{fm}	(1.23)	2.51 ^{dk}	(1.04)	3.34 ^{ghijklm}	(.91)	2.43 ^{ah}	(1.01)
Teacher engages in formal modes of individualized instruction	4.34	.0001	2.43 ^a	(1.01)	1.98 ^{ab}	(.71)	2.25	(.94)	2.13	(.98)	2.49 ^b	(1.06)	2.20	(.97)	2.27	(.97)	2.01	(.87)

Table 4 (continued)

			Chemistry		Math		Biology		Psychology		Sociology		Political Science		English		History	
Variable	F	p	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Liberal Arts Institutions																		
Teacher concern about demonstrating a process	3.27	.0021	3.52	(.71)	3.68 ^a	(.50)	3.41	(.69)	3.07 ^a	(.83)	3.35	(.83)	3.30	(.70)	3.42	(.76)	3.27	(.80)
Teacher concern with advancing students' socioeconomic status	3.41	.0015	1.92	(.90)	2.27 ^a	(.91)	1.92	(1.01)	1.65	(.90)	1.78	(.86)	1.70	(.60)	1.76	(.83)	1.63 ^a	(.66)
Teacher emphasizes writing and research in classes	15.88	.0000	2.58 ^g	(.93)	1.88 ^{abdef}	(.81)	2.90 ^{cj}	(1.12)	2.66 ^{ah}	(1.26)	3.08 ^d	(1.04)	3.17 ^e	(.81)	3.52 ^{fghij}	(.80)	2.70 ^{bi}	(1.05)

Table 4 (continued)

	Chemistry				Math		Biology		Psychology		Sociology		Political Science		English		History	
Variable	F	p	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Community Colleges																		
Teacher concern about transmitting fact of discipline	9.30	.0000	3.88 ^e	(.38)	3.83 ^d	(.43)	3.81 ^b	(.46)	3.81 ^c	(.39)	3.73	(.49)	3.60	(.60)	3.46 ^{abde}	(.79)	3.76 ^a	(.51)
Teacher concern with students' roles in society	3.97 (.75)	.0003	3.02 ^a	(.94)	3.23	(.83)	3.43	(.74)	3.48	(.76)	3.53	(.65)	3.26	(.74)	3.48 ^a	(.76)	3.41	
Teacher concern with advancing students' socioeconomic status	2.79	.0071	2.32 ^a	(.92)	2.60	(.92)	2.34 ^a	(.96)	2.06	(.83)	2.51	(1.00)	2.31	(1.05)	2.51	(.97)	2.35	(.98)
Best learning occurs when teacher and students determine course content cooperatively	6.27	.0000	1.69 ^{abcd}	(.65)	2.09	(.68)	2.18 ^a	(.75)	2.30 ^b	(.79)	2.51 ^d	(.89)	2.18	(.83)	2.33 ^c	(.85)	2.20	(.73)
Best learning occurs when students progress at their own pace	6.43	.0000	2.14 ^a	(.92)	2.24 ^b	(.73)	2.42	(.73)	2.63	(.75)	2.55	(.72)	2.50	(.75)	2.68 ^{ab}	(.82)	2.43	(.78)
Best learning occurs when competition is fostered	5.38	.0000	2.47	(.80)	2.47 ^{ab}	(.72)	2.30	(.75)	2.00 ^a	(.67)	2.15	(.77)	2.41	(1.02)	2.11 ^b	(.71)	2.21	(.78)
Students need frequent feedback	6.02	.0000	3.37	(.52)	3.35	(.60)	3.24 ^c	(.65)	3.53 ^b	(.59)	3.22	(.59)	3.21	(.64)	3.50 ^{ac}	(.57)	3.11 ^{ab}	(.65)
Teacher emphasizes writing and research in classes	95.38	.0000	2.06 ^{ahi}	(.68)	1.50 ^{abdefg}	(.65)	2.18 ^{bjk}	(.88)	2.21 ^{cl}	(.99)	2.51 ^{en}	(1.12)	2.38 ^{dm}	(.93)	3.62 ^{giklmno}	(.86)	2.75 ^{fhjo}	(.97)

Table 5:
Assessment of Institutional Type and Academic Discipline as
Predictors of Teaching Goals, Assumptions, and Practices

	Institutional Type with Academic Discipline Held Constant	Academic Discipline with Institutional Type Held Constant
<u>Instructional Goals</u>		
Helping students to improve and make the most of their roles in society	0.042	0.013
Encouraging students' overall personal development	0.040	0.005
Having students advance their socioeconomic status	0.083	0.014
<u>Assumptions about Students and Optimal Learning Conditions</u>		
Students need frequent feedback on their performance	0.027	0.016
Best learning occurs when competition is fostered	0.004	0.038
<u>Teaching Practices</u>		
Teacher emphasizes writing and research in classes	0.009	0.221
Teacher engages in formal models of individual instruction	0.040	0.015

Note: The r-squared change in Column 1 is that contributed by Institutional Type after controlling for Academic Discipline; Column 2 represents r-squared due to Academic Discipline after controlling for Institutional Type. All changes are significant at $p < .01$.